MONITORING and EVALUATION

TOPIC REPORT
DRAFT 02.09.2002
BY

WILLIAM CHRISTENSEN
KARI AAMODT ESPEGREN

Institutt for energiteknikk
Institute for Energy Technology

THE 12 ELEMENTS OF AN ENERGY AUDIT PROGRAMME

IMPLEMENTING INSTRUMENTS

GOALS OF THE PROGRAMME

LEGISLATIVE FRAMEWORK

PROMOTION AND MARKETING

SUBSIDY POLICY

KEY PLAYERS

STRUCTURE OF ADMINISTRATION

MONITORING SYSTEM

ENERGY AUDIT MODELS

TRAINING OF AUDITORS

AUTHORISATION OF AUDITORS

QUALITY CONTROL

AUDITOR´S TOOLS

DEFINITION

MONITORING

- continuous or repetitious activity
- running in parallel with other activities over the lifetime of the project
- keep control and obtain information on the impact

DEFINITION

EVALUATION

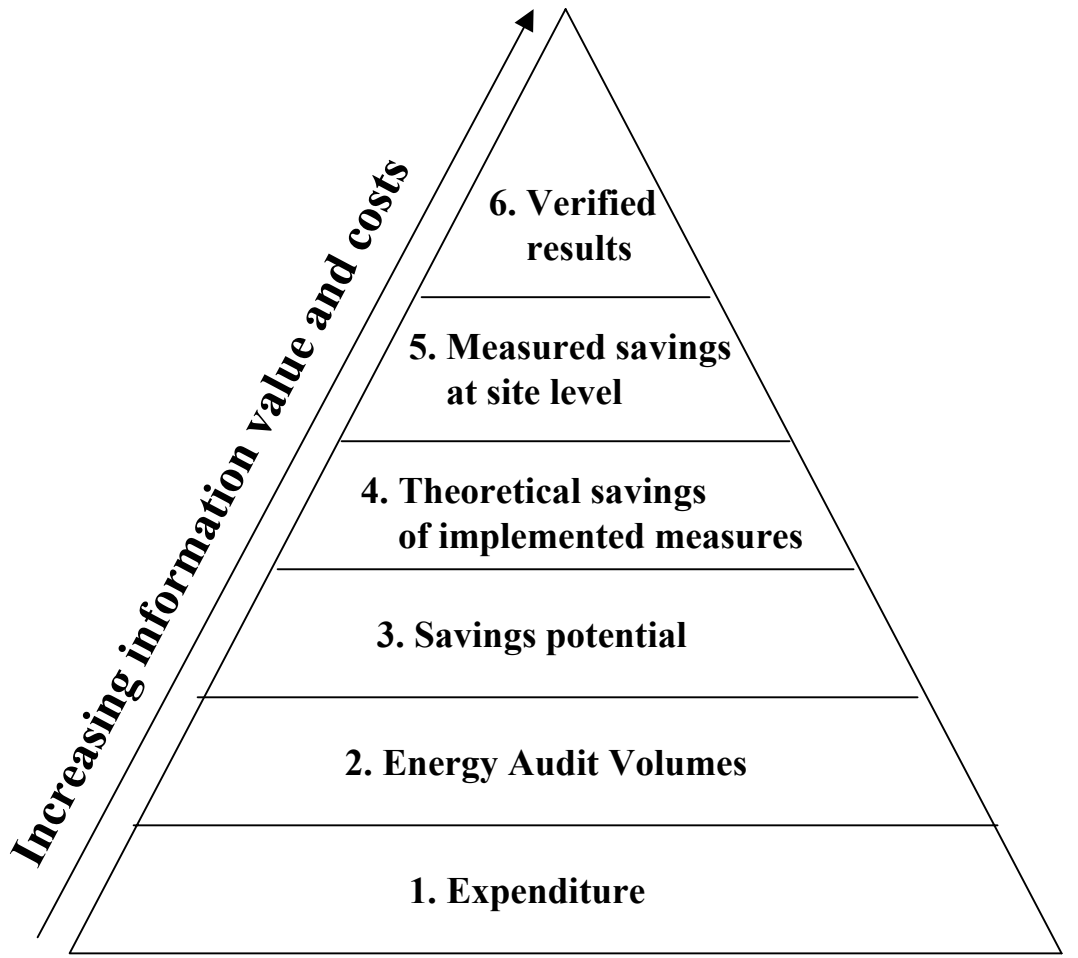
• undertaken with regular intervals - end of the lifetime of a programme

• the achievements of the programme

• possible measures to improve the programme

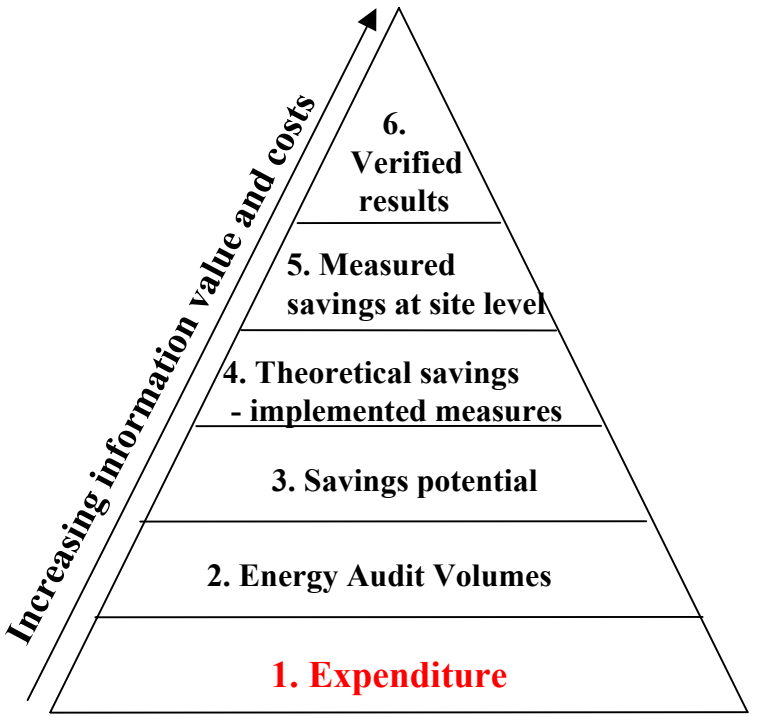
• monitoring and evaluation are linked in the sense that the quality of an evaluation depends on the extent and quality of the monitoring.

RELATIONS BETWEEN MONITORING, INFORMATION VALUE AND COSTS



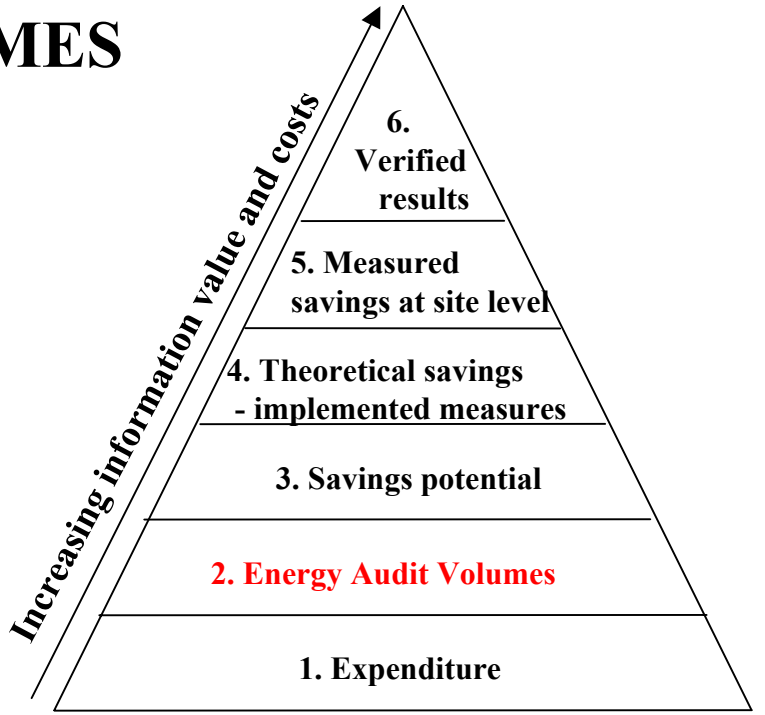
1. EXPENDITURE

- monitoring of the amount of subsidies
- information gathered from the EA application
- no control of audits
- administrative costs: low



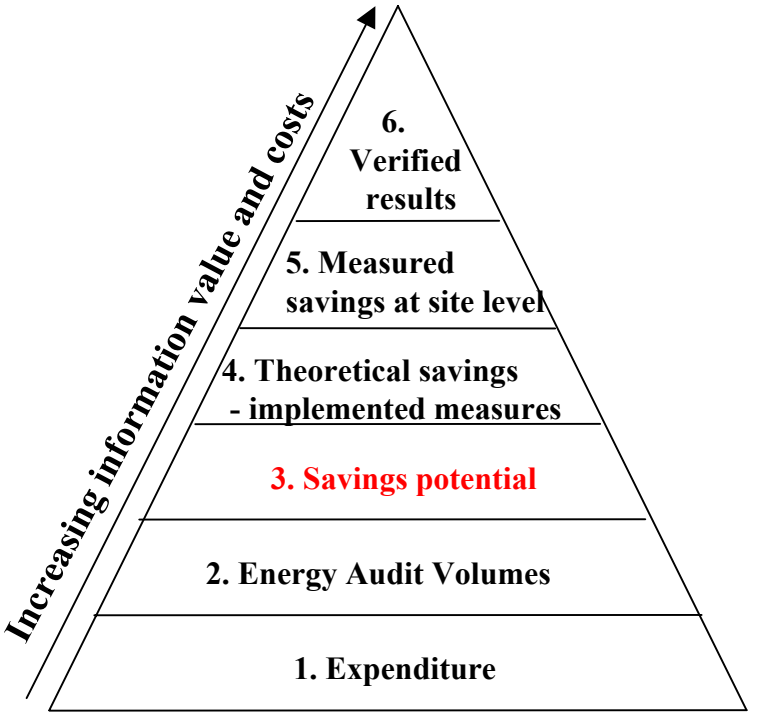
2. ENERGY AUDIT VOLUMES

- monitor the amount number of EA
  – i.e. devided on sectors
- information gathered from the EA application
- no control of audits
- administrative costs: low



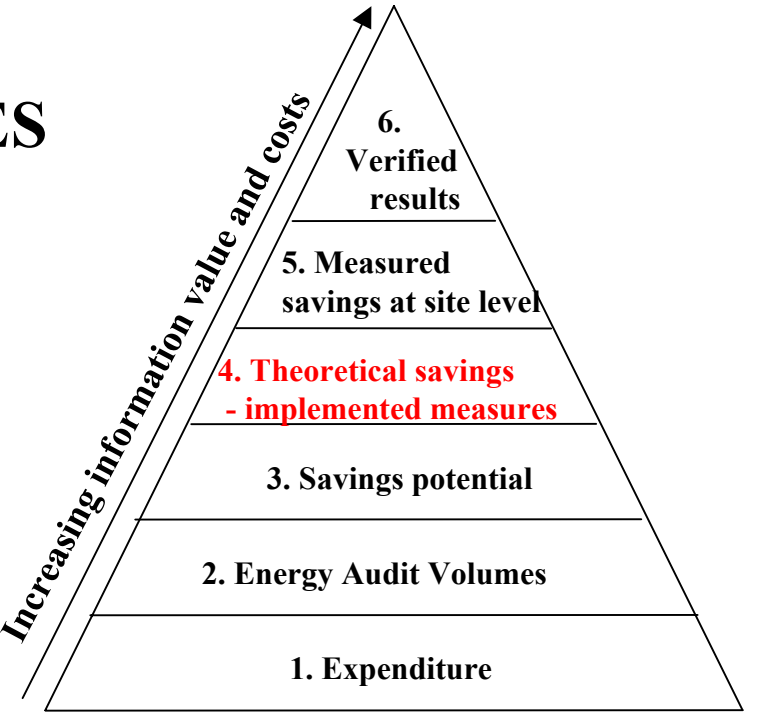
3. SAVINGS POTENTIAL

- information on energy efficient measures
- calculated potential savings
- information from the EA-report
- need a monitoring tool
  – database or spreadsheet
- administrative costs: higher
- this level is used by: DMSS (F)



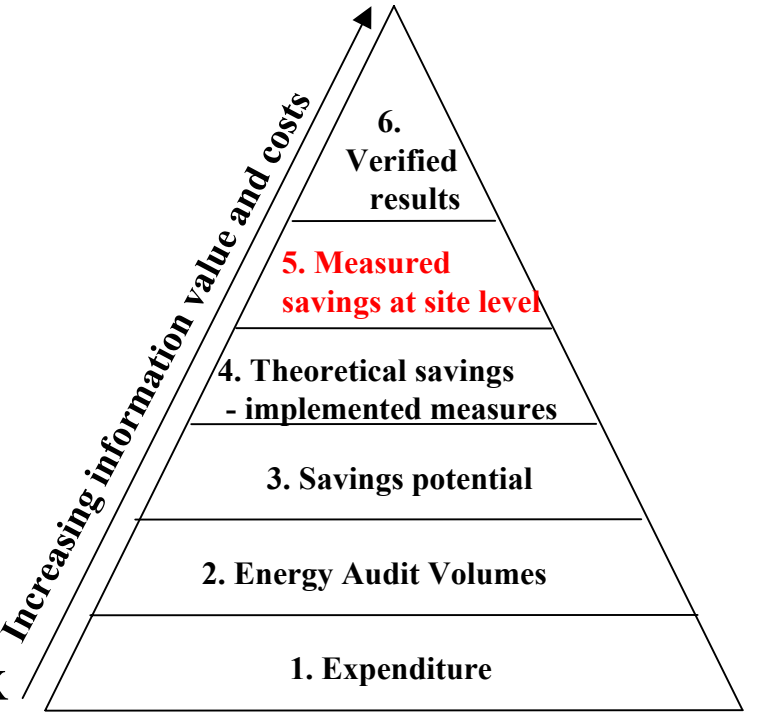
4. THEORETCAL SAVINGS - OF IMPLEMENTED MEASURES

- information on implemented energy efficient measures
- calculated potential savings of the implemented measures
- information from the EA-report combined with information from a questionnaire or site visits
- need a monitoring tool – database
- administrative costs: higher
- This level is used by: Motiva (SF)



5. MEASURED SAVINGS - AT SITE LEVEL

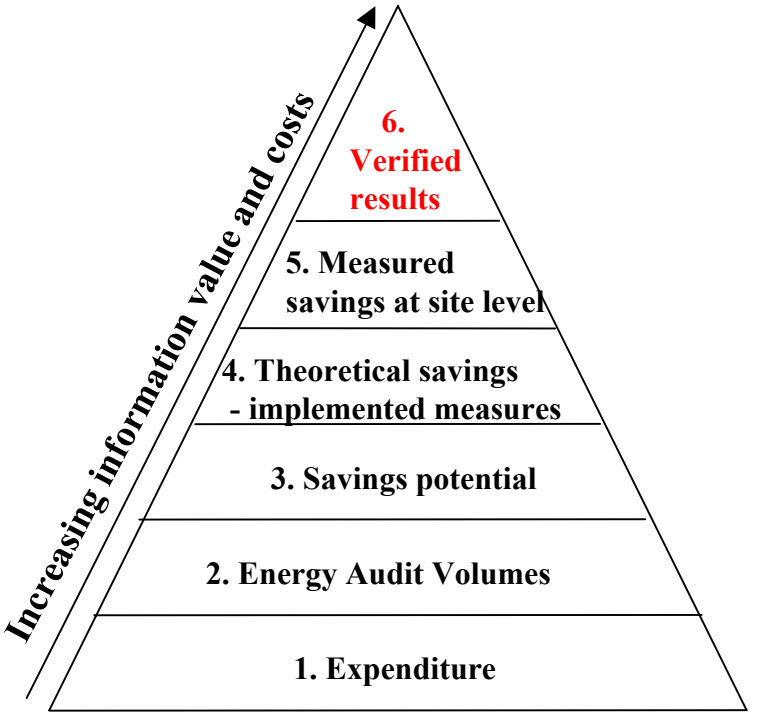
- questionnaire on energy use in company/building on annually basis
- information from the EA-report and from the questionnaire
- corrections for climate changes and changes in production volumes/mix
- Energy Monitoring System on site level
- need a monitoring tool – database
- administrative costs: higher
- This level is used by: ELO-Scheme (DK), LTA (NL), IEEN (N)



6. VERIFIED RESULTS

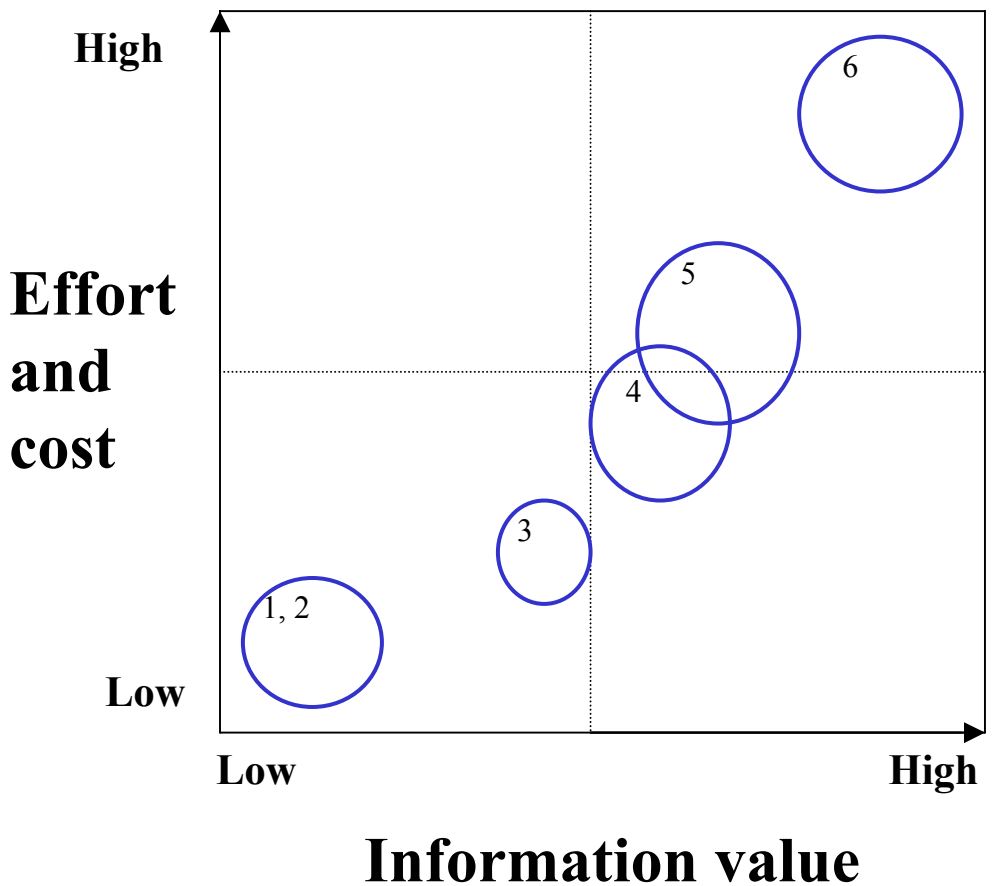
- verification of the impact of implemented measures
- physical measures are individually monitored/verified by a third party
- administrative costs: higher
+ investments in instruments
- EA-programmes: control of a sample
- This level can be useful in:

CDM-projects: CO_2-savings (Kyoto Protocol)
ESCOs: guaranteed results



Options	Cover age	Complexity	Theoretical cost		Information gained from
			Small scheme	Large scheme	
1. Expenditure	All	Easily	No extra costs	No extra costs	Application
2. Energy Audit Volumes	All	Easily	Ignorable extra costs	Small extra costs - 0,25 man month/year	Application
3. Savings potential	All	More complex tool necessary	Small extra costs. Need spreadsheet 0,5 man month	Development costs 6 man months 1 man month.	Audit report
4. Theoretical savings of implemented measures	All / samples	More complex – need tool and feedback	2 man months	4 man months	Questionnaire/ site visits
5. Measured savings at site level	All / samples	Complex - need tool, analytical expertise	4 man months	1 man year	Questionnaire (yearly)
6. Verified results	Samples	Complex - need tool, feedback, analytical expertise	6 man months (based on representative samples)	Costs in the range of 1 man year (based on representative samples)	Monitoring on site level

EFFORT AND COST vs. INFORMATION VALUE



EVALUATION

- carried out by a third party
- the aim is to provide an objective consideration of the impact of a programme
- evaluations are usually carried out at the end of a programme.
- evaluations undertaken during the mid-life of a programme serve as an instrument to correct the operation or direction of the programme.
- the quality of the evaluation increases with the quality of the monitoring.

Relevant information/questions in evaluation

- Have the objectives of the programme been met?
- The interest in the programme in terms of applications and amount of audits undertaken
- The impact of the programme in terms of energy units saved
- The amount of public money spent per saved energy unit
- The environmental impacts
- The impact on employment
- What would be the long-term effect of the programme on society?
- The target groups opinion of the programme

RECOMMENDATION - MONITORING

- consider what kind of data that should be collected (what kind of data is needed to compile information for the public authorities)
- level of ambition should be decided upon as early as possible
- the monitoring system should be designed at the same time as the EAP
- establish a monitoring system that can cope with an expansion of the programme
- the operating agent is recommended to establish a simple database
- monitoring based on questionnaires is easier when the audit programme is part of a broader scheme, such as LTAs or a Network

RECOMMENDATION - EVALUATION

- evaluation when the EAP have been running for 2-3 years
- provide objective information of the impact and the operation of the energy audit programme
- determine if there is a need for adjustments, if the EAP should be closed down or if it should be kept unchanged
- the most important issues:

- does the programme support the government's energy policy?
- can the impact justify the public money spent on it, including subsidies, operation and marketing?
- gather information on the target group's opinion of the programme